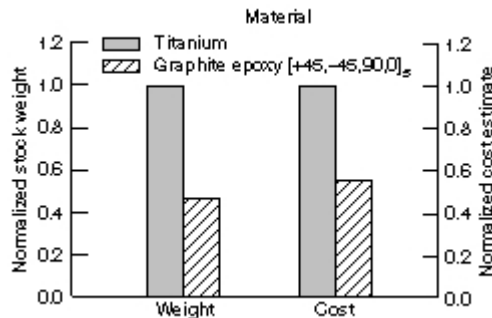


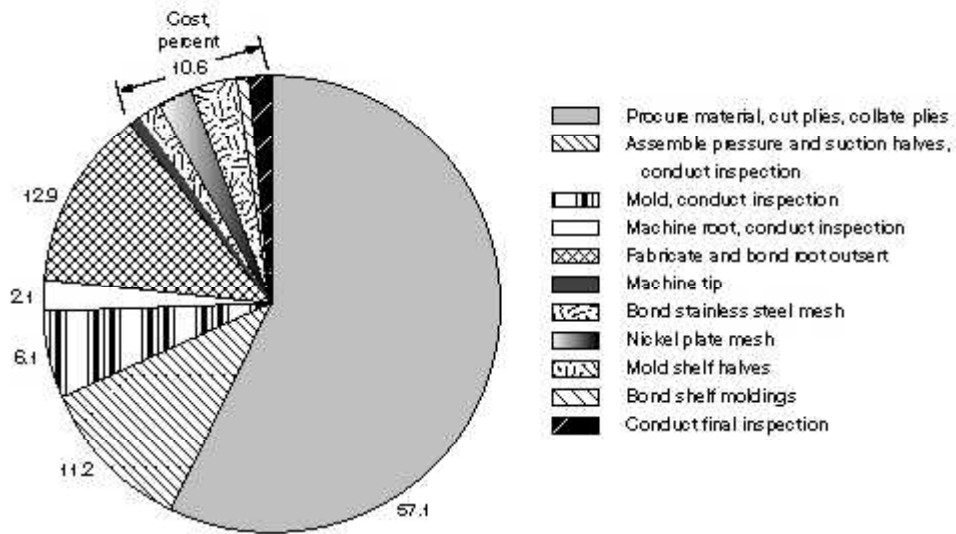
# T/Best: Technology Benefit Estimator for Composites and Applications to Engine Structures

Progress in the field of aerospace propulsion has heightened the need to combine advanced technologies. These benefits will provide guidelines for identifying and prioritizing high-payoff research areas, will help manage research with limited resources, and will show the link between advanced and basic concepts. An effort was undertaken at the NASA Lewis Research Center to develop a formal computational method, T/BEST (Technology Benefit Estimator), to assess advanced aerospace technologies, such as fibrous composites, and credibly communicate the benefits of research. Fibrous composites are ideal for structural applications such as high-performance aircraft engine blades where high strength-to-weight and stiffness-to-weight ratios are required. These factors--along with the flexibility to select the composite system and layup, and to favorably orient fiber directions--reduce the displacements and stresses caused by large rotational speeds in aircraft engines.



*Maurer stock weight and cost estimation for manufacturing a fan blade.*

T/Best can readily evaluate typical blade manufacturing processes and the benefits of using composites to construct fan and compressor blades, as well as determine how to update blade geometry to maximize a rotor's efficiency. The bar graph compares these benefits with those of state-of-the-art titanium blades. The pie chart shows the cost required to manufacture composite fan blades as estimated with T/BEST.



*Cost of a process for manufacturing resin matrix composite blades.*

**Lewis contact:** Dr. Christos C. Chamis, (216) 433-3252, [smccc@popserve.grc.nasa.gov](mailto:smccc@popserve.grc.nasa.gov)

**Author:** Dr. Christos C. Chamis

**Headquarters program office:** OA